

## Appendix C3 – Source Identification (Stormwater Management)



# **BMP Geodatabase December 2020 Submittal to MDE Technical Memorandum**

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## **BMP Geodatabase Technical Memorandum**

### **1 Introduction and Background**

Harford County's (County) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit (Permit Number 11-DP-3310, effective 30 December 2014 through 29 December 2019) requires the County to conduct preventative maintenance inspections of all environmental site design (ESD) treatment systems and structural stormwater management practices on a triennial basis. As part of the MS4 annual report requirements, the County is required to populate and submit a geodatabase in compliance with the *Maryland Department of the Environment, National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4), Geodatabase Design and User's Guide* (May 2017). This geodatabase is referred to as the MDE MS4 Geodatabase in this document. The data in the MDE MS4 Geodatabase is used to assist the Maryland Department of the Environment (MDE) in calculating the Total Maximum Daily Load (TMDL) reductions to the Chesapeake Bay. The County is required to report annually to MDE documentation identifying the stormwater management practices inspected, the number of maintenance inspections, the number of follow-up inspections, the enforcement actions used to ensure compliance, and the maintenance inspection schedule in the MDE MS4 Geodatabase.

The MDE MS4 Geodatabase is not designed to assist in performing inspections of stormwater management infrastructure. The Harford County Department of Public Works, Watershed Protection and Restoration Office (MS4 Office) has developed a BMP Geodatabase schema with the assistance of EA Engineering, Science and Technology Inc., PBC (EA) to assist with gathering the data for triennial inspection requirements.

The MS4 Office will begin using Survey 123 to complete the stormwater management triennial maintenance inspections. This development has spurred the need for a revised BMP geodatabase schema for use in the field by the Triennial Inspection team.

#### **1.1 Purpose**

The MS4 Office contracted EA to assist in the design of the HCBMP Geodatabase schema, populate the HCBMP Geodatabase, design and implement the ArcGIS Survey123 Triennial Inspection Application, and develop ETL/Script tools to transfer the HCBMP Geodatabase into the MDE MS4 Geodatabase.

The purpose of this Technical Memorandum is to:

1. Identify the user of the HCBMP Geodatabase in the County
2. Document HCBMP Geodatabase use
3. Document the HCBMP Geodatabase schema
4. Document the procedures and source data for the HCBMP Geodatabase data population
5. Identify data population rules
6. Document ETL/Script to transform the HCBMP Geodatabase into the MDE MS4 Geodatabase.



## 2 HCBMP Geodatabase Users

Stormwater management practices information is needed by various divisions within the Department of Public Works for various objectives.

### 2.1 Watershed Protection and Restoration Office (MS4 Office)

The MS4 Office is responsible for compiling the information from various divisions and departments of the County and reporting that information to MDE for NPDES MS4 compliance.

The NPDES MS4 permit requires the County to conduct preventative maintenance inspections of all ESD treatment systems and structural stormwater management practices on a triennial basis. As part of those inspections, the County is required to report annually to MDE documentation identifying the stormwater management practices inspected, the number of maintenance inspections, the number of follow-up inspections, the enforcement actions used to ensure compliance, and the maintenance inspection schedule in the MDE MS4 Geodatabase.

### 2.2 Division of Construction Management Inspection Bureaus

Stormwater management inspections are completed by two separate bureaus within the Department of Public Works, Division of Construction Management (Table 1). The Bureau of Construction Inspections completes stormwater management inspections for construction and 1-year post construction. The Bureau of Construction Inspections use EnerGov to track their inspections, as their workflow is centered around building permit issuances, construction management, and permit closure.

The Bureau of Stormwater Management completes stormwater management triennial maintenance inspections after the building permit has been completed and closed. The HCBMP Geodatabase schema design was developed for the Bureau of Stormwater Management's stormwater management triennial maintenance inspections.

*Table 1: Stormwater Management Inspection Responsibilities*

	Bureau of Construction Inspections	Bureau of Stormwater Management
<b>Purpose</b>	Inspections during construction and 1-year post construction inspection	Triennial maintenance inspections
<b>Tracking</b>	EnerGov	EnerGov currently. Transitioning to ArcGIS Survey123
<b>Employees</b>	Mike Davies	Mike Rist Christy Joyce



### 3 HCBMP Geodatabase Schema

The HCBMP Geodatabase schema was developed using ArcGIS Desktop software and is used to:

- manage the Bureau of Stormwater Management's triennial stormwater maintenance inspections
- MS4 permit compliance.

The HCBMP Geodatabase schema consists of 11 objects: 4 feature classes, 4 flat tables, and 3 relationships classes. Figure 1 is the expanded view of the HCBMP Geodatabase in ArcCatalog.

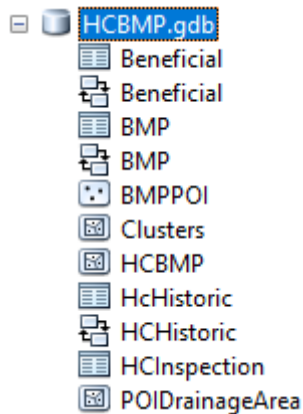


Figure 1: HCBMP Geodatabase

Table 2 lists the purpose of each object in the HCBMP Geodatabase.

Table 2: HCBMP Geodatabase Schema

Object Name	Type	Relationship With	Purpose
<b>Beneficial</b>	Flat Table	<i>HCBMP</i>	Record of the beneficial user of the BMP. Beneficial users are those who drain towards the BMPs. BMPs that have failed and do not have a responsible party to address the failure are billed by the County to recoup the cost. The billing is based on the percentage of the area draining to the BMP.
<b>BMP</b>	Flat Table	<i>HCBMP</i>	Record of additional information about the BMP that is not necessary for the triennial inspections but is required for the MDE MS4 Geodatabase.
<b>BMPPOI</b>	Point-Feature Class	<i>None</i>	POI is the point of interest for the POI Drainage Area. This feature class shows a specific geographical point indicating a study area or point of investigation (POI) in which there could be one or many Best Management Practices (BMPs) and includes





Table 2: HCBMP Geodatabase Schema

Object Name	Type	Relationship With	Purpose
			information associated with watershed, drainage area, and BMP construction. This feature class is not needed for the Triennial Inspection but is required for MDE Reporting.
<b>Clusters</b>	Polygon-Feature Class	<i>None</i>	A polygon around BMPs of the same type that drain to the same POI to allow for percentage of inspection to be performed and applied to the whole group. All BMPs within a Cluster Polygon will have the same MDE BMP number but different Local BMP numbers.
<b>HCBMP</b>	Polygon-Feature Class	<i>Beneficial BMP HCHistoric HCInspection</i>	Footprint of the BMP and attributed based on the inspector's needs.
<b>HCHistoric</b>	Flat Table	<i>HCBMP</i>	Record of historic inspections pertaining to the BMP.
<b>HCInspection</b>	Flat Table	<i>HCBMP</i>	Record of maintenance inspections using new Survey123 application.
<b>POIDrainageArea</b>	Polygon-Feature Class	<i>None</i>	The drainage area to the point of interest, this feature class is not needed for the Triennial Inspection but is maintained for MDE Reporting.

## 4 HCBMP Geodatabase Population

### 4.1 Source Information

There are two types of stormwater management plans: engineered plans and standard plans. Both sets of plans are managed in EnerGov during the permitting process and given a Project Number. The acceptance of an As Built is managed by the Engineer Associate from the Bureau of Stormwater Management and recorded in an Excel sheet. The As-Built acceptance date is the date used to identify the fiscal year the stormwater management practice was accepted by the County. The As-Built plans are scanned and managed in a Laserfiche file system by Project Number and Project Name.

#### *Engineer Plans*

Engineer Plan permits require a construction bond and are typically used for large development projects. Upon construction completion and approval of the stormwater management As-Built plans, the construction bond is converted into a maintenance bond. The maintenance bond is released after a 1-year post-construction inspection is performed by the Bureau of Construction Inspections. The 1-year post-construction inspection is recorded in EnerGov since it results in the release of a bond. After that 1-year post construction inspection is completed and accepted,



the 3-year triennial inspection cycle starts. These are the plans that have been reviewed by EA and uploaded into the HCBMP Geodatabase.

#### *Standard Plans*

Standard Plan permits do not require a construction bond or maintenance bond. These plans are common for small single-family constructions. The Bureau of Construction Management completes the final inspection for standard plans concurrently with the As-Built acceptance. These plans have not been reviewed by EA and are not in the HCBMP Geodatabase at this time.

#### *Property Information*

Harford County Department of Planning and Zoning creates the cadastral layer and provides that to the Maryland State Department of Assessments and Taxation (SDAT). The cadastral layer is maintained on the County SDE and is used to populate the property information (BMP Address, BMP City, BMP Owner). An SDAT link is in the HCBMP feature class. The SDAT link enables the Bureau of Stormwater Management to access the latest property information during their triennial inspections.

#### *Management Company Information*

Owners of the stormwater management practice hire companies that specialize in stormwater management maintenance to maintain the facility. These companies along with the owners receive a copy of the triennial inspection. The information about the management companies is provided by the Bureau of Stormwater Management.

## **4.2 Geometry Population**

The As-Built are georeferenced into ArcMap, and the HCBMP polygon and POI Drainage Area are delineated from those. All BMPs are mapped despite providing water quality credit or not. BMPs that extend beyond property boundaries may be broken by the property line to account for the individual owners responsible for the maintenance of the BMP. Practices that are broken by the property line are grouped into one MDE BMP identification (ID) number and the Inspection of Cluster ESD Practice may apply (See Section 4.4). For development with more than one drywell on a single lot, the BMP Polygon is a multipolygon with the same BMPid and MDEid. The BMP POI location is the downstream point of the POI Drainage Area and is typically a study point in the stormwater design report.

## **4.3 Attribute Population**

With the management of the stormwater BMP involving various divisions, it is important to note the sources and procedures for data population in the HCBMP Geodatabase. The following section identifies in more detail the source of information for each attribute.

### **4.3.1 Project Specific**

For attribute population of the HCBMP, BMP POI, and POI Drainage feature class and BMP table, project-specific data are required. The As-Built provide the information below to populate the HCBMP Geodatabase objects identified above. The following attributes appear multiple times in various objects:



- ProjectNo
- ProjectName
- BMPTYPE
- BMPName
- NumBMP
- As-built Link
- ApprovedPlanLin
- PermitNo
- PermitApproval
- BMPasbuilt
- Planapproval
- yearconstructed.

The layout of the object and the attributes in them is available in Appendix A. This information is populated at the same time as the geometry of the features classes is delineated.

#### 4.3.2 Engineering Review

A Professional Engineer reviews the As-Built and the stormwater design report to determine the PE addressed, PE required, Impervious Area Treated at the BMP POI. This information is recorded in the BMPPOI feature class. The MS4 Office has also elected to record the volume of each BMP and that volume is recorded in the BMP Table. This information is recorded after the geometry is completed. The engineer also reviews the drainage area and BMP footprint to confirm the GIS data match the As-Built.

#### 4.3.3 Geospatial Calculations

The POI Drainage Area, HCBMP feature class, and BMP Table require geospatial calculations. Table 3 identifies the HCBMP geodatabase object, attribute, source data and geoprocessing tool used for geospatial calculations.

*Table 3: HCBMP Geodatabase Geospatial Calculations*

HCBMP.gdb Object	Attribute	Harford County GIS Source Data	Geoprocessing Tool
POI Feature Class	MD_North	NA	Calculate geometry (X coordinate of Centroid, Y coordinate of Centroid)
	MD_East		
	Watershed8digit	Watershed8digit	Overlay
	Watershed12digit	Watershed12digit	Overlay
	Land_Use	Predominant	Overlay
	LU_County		
HCBMP	MDE Permit Number	NA	Field calculate (Current MDE Number)
	BMPAddress	Cadastral	Overlay
	BMPCity		
	BMPZip		
	TaXID		



*Table 3: HCBMP Geodatabase Geospatial Calculations*

HCBMP.gdb Object	Attribute	Harford County GIS Source Data	Geoprocessing Tool
BMP Table	TaxIDLink	SDAT website	Create link using TaxID and syntax
	BMPInspectionID	NA	Latest BMP inspection ID.
	Asbuilt Link	Laserfiche	Copy a link using Laserfiche and project number.
	BMPDrainID	POIDrainageArea	Spatial join POIDrainageArea and populate BMPDrainID number.
	BMPClass	NA	Field calculate Structural or ESD based on BMP Type (Sql statement in the field calculator)
	BMPStatus	NA	Field Calculate (Active)
	CONPurpose	NA	Field Calculate (NEWD)
	BMP_Drain_Area	POIDrainageArea	Join POI Drainage Area and copy Drainage Area from POIDrainageArea

#### 4.3.4 Numbering

In the BMP POI feature class, the POIid Attributes and in the POIDrainageArea feature class, the attribute DrainageAreaid are populated fiscal year the As-Built are accepted by the County.

In the HCBMP feature class and the BMP table, the BMPid is populated sequentially.

In the BMP table, the MDEid is populated sequentially. An Excel sheet, HCBMP.gdb Numbering, is the official record of numbering system and is stored on Harford County's WRE drive under GIS Projects. The Excel sheet is utilized to facilitate the population of the IDs and prevent duplicates.

#### 4.4 Cluster Feature Class

The County has opted to group or cluster BMPs of the same type draining to the same POI for triennial inspections. In November 2019, the County adopted the Inspection of Clustered ESD Practices to apply this cluster inspection protocol. The cluster feature class is set up to identify the number of BMPs within the polygon that need to be inspected for the protocol. Appendix B is the Inspection of Clustered ESD Practices.

#### 4.5 Geodatabase QAQC Population Rules

To assist in standardized data population, specific rules were created. The rules are based on the County's Triennial inspection program and the MS4 Permit requirements. The QAQC rules, the feature class they apply, and the exceptions are listed in Table 4.

*Table 4: QAQC Rules*

Feature Class	QAQC Rule	Exception
HCBMP POI Drainage Area	HCBMP must be inside the POI Drainage Area	The drainage areas for drywells, non-rooftop disconnect, or sheet flow to conservation areas is the rooftop



*Table 4: QAQC Rules*

Feature Class	QAQC Rule	Exception
		unless the identified practice is part of a larger POI drainage area. Therefore, not all drywells, non-rooftop disconnect, or sheet flow to conservation area may be in the POI drainage area.
HCBMP	HCBMPs do not overlap	Not Applicable
POI Drainage Area	POI Drainage Areas do not overlap	Historically BMPs may be nested within another POI Drainage Area. Care is to be taken to remove these nested drainage areas.
BMP POI POI Drainage Area	BMP POI point is always outside of the POI Drainage Area	BMP POI for pervious pavement that is not associated with other BMPs is located inside at the centroid of HCBMP. BMP POI for sheet flow and drywell that is not associated with other BMPs is location outside of the POI Drainage Area and may not be immediately adjacent to the POI Drainage Area.
BMP POI Imp_Arces POI Drainage Area	BMP POI Imp_Arces attribute cant be larger than BMP POI Drainage Area. (Note: Imp_Arces has units of acres and BMP POI Drainage Area has a shape size in square feet. Unit conversion is used to check and verify this rule).	Not Applicable



## 5 HCBMP Geodatabase Population Status

As of December 2020, EA continues to review the As-Built plans and update the HCBMP geodatabase. The table below is based on fiscal year (FY). The information in Table 5 is based on the BMP Table in the HCBMP Geodatabase as of 10 December 2020. The HCBMP Polygon has more records than identified in Table 5, as we have not reconciled all the historic GIS data with the BMP Table entries.

*Table 5: BMP Table Population Status*

Fiscal Year MDE ID Number	BMPs	Number of As- builts	Source of input data	Reviewed
FY20	233	69	EA	EA (PE)
FY19	201	47	EA	EA (PE)
FY18	205	49	EA	EA (PE)
FY17	81	36	EA	EA (PE)
FY16	149	31	Other Consultant	EA (PE)
FY15	176	49	Other Consultant	EA (PE)
FY14	152	53	Other Consultant	EA (PE)
FY13	21	40	Other Consultant	EA (GIS)
FY12	29	36	EA	EA (GIS)
FY11	76	42	EA	EA (GIS)
FY10	28	37	EA	EA (GIS)
FY09	11	20	EA	EA (GIS)

Below specifies the review completed as indicated in the table above.

- EA (PE) means Professional Engineer reviewed the drainages to the POI, verified BMP locations and footprint, identified POI locations, and provided the calculations for PE addressed, PE Required, Impervious Acres Treated for each POI, and the ESDv for all the BMPs. This step was done after EA(GIS) review occurred, meaning the EA(GIS) review below was also completed for these fiscal years.
- EA(GIS) means a GIS Analyst georeferenced the As-Built plans to delineate BMP locations, drainages, and POI locations. Populated the ProjectNo, ProjectName, BMPTYPE, BMPName, NumBMP, AsbuiltLink, ApprovedPlanLink, PermitNo, PermitApproval, BMPasbuilt, Planapproval, yearconstructed, BMPaddress, BMPcity, and BMPZip from the As-Built plans and assign POI ID, Drainage Area ID Number, MDE ID Number, and BMP ID based on the years and sequentially added. EA GIS Analyst maintains a separate Excel sheet to facilitate the population of the IDs and prevent duplicates.



- EA(GIS) – PE review but still need final check means the PE review is completed and some of the data are updated in the HCBMP Geodatabase but the data has not gone through QAQC steps.

It is important to note the Unpopulated features is decreasing as the fiscal year reviews are completed and updated in the HCBMP geodatabase.

## 6. HCBMP Geodatabase Transformation

The HCBMP geodatabase schema does not match the MDE MS4 Geodatabase. For the December 2020 submittal, EA will have developed an ETL tool to transform the data from the HCBMP Geodatabase in the MDE MS4 Geodatabase. The equations and data transformation of the HCBMP Geodatabase to the MDE MS4 Geodatabase will be documented in this section.



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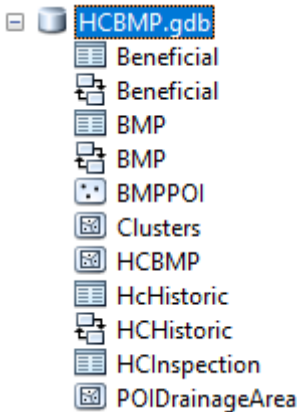


## Appendix A – HCBMP Schema



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HCBMP Geodatabase – Schema August 2020



BMP Table – Related to HCBMP Many to One HCBMP		
Attribute	Description	Source
BMPid	Unique Harford County specific ID	Sequential
MDEbmpid	MDE unique ID	Sequential
BMPPOIID	BMPs POI’s unique ID	BMPPOIID
BMPDrainID	POI Drainage Area’s unique ID	POIDrainageArea
BMPTYPE	Using domain table from MDE Guidance May 2017	As-Built
BMPname	Name of the Project	As-Built
PermitNo	Using County Construction Permit System	As-Built
Permitapproval	When the construction permit was approved	As-Built
BMPasbuilt	Date of As-built	As-Built
PlanApproval	Date the plans were approved	As-Built
Complink	Link to the computations	Laserfiche
BMPClass	MDE required- ESD or Structural	As-Built
BMPStatus	MDE Required-Active	All BMPS recorded are active
BMPDrainageArea	The drainage area to the POI in acres	POIDrainageArea
Volume	Calculated ESDV to each BMP	Stormwater Design Report
Con_Purpose	MDE required – New development of redevelopment of site	All BMPs recorded are New Development

HCInspection - RelatedTable – Many Entries to One HCBMP		
Attribute	Description	Source
BMPID	Unique id for Harford County	Sequential number
InspectDate	Date of Inspection	Energov
Inspector	Name of Inspector performing inspections	Energov
InspectRating	Rating of inspection 0-4	Energov
Type	Type of Insection	Energov
Notes	Notes about the inspection	Energov
InspectionLink	Link to the pdf of inspection	Laserfiche

Clusters - Geometry Polygon		
Attribute	Description	Source
ClusterID	The id number for the clustered BMPs	GIS
Comments	Any specific notes about the cluster	GIS

HCBMP - Geometry Polygon One to Many BMP Table		
Attribute	Description	Source
BMPid	Unique id for Harford County	Sequential number
BMPTYPE	Using domain table from MDE Guidance May 2017	As-Built
Num_BMP	Number of BMPs of the same type to the same POI	As-Built
PermitNo	Using County Construction Permit System	As-Built
ProjectName	Project Name	As-Built
ProjectNumber	Project Number	As-Built
AsbuiltLink	Laserfiche location	Laserfiche
Year_Constructed	Year the BMP was constructed	As-Built/Aerials
BMPAddress	Closest physical address to BMP	GIS
BMPcity	The city the BMP is in	
BMPZip	The zip code the BMP is in	
PropertyType	Type of Property (Using domain table from MDE Guidance May 2017)	
ManagerCo	The Management company	Bureau of Stormwater Management
Ownership	HOA, Beneficial Users, No HOA	GIS
Ownername	Property Owner’s Name	
Ownercity	Property Owner’s City	
OwnerState	Property Owner’s State	
OwnerZip	Property Owner’s Zip Code	
TaxID	SDAT ID	SDAT
TaxIDLink	SDAT Link	SDAT
MaintenanceAgreement	Maintenance pdf	Bureau of Stormwater Management
ClusterID	The id number for the clustered feature class	GIS

BMPPOI-Geometry Point		
Attribute	Description	Source
BMPPOIID	POI’s unique ID	Sequential number based on Fiscal Year
MD_NORTH	Northing	GIS
MD_EAST	Easting	GIS
Land_Use	Predominant land use	GIS
LU_County	County unique land user (predominant)	GIS
Watershed8DGT	Maryland 8 digit hydrologic unit code	GIS
Watershed12DGT	USGS 12 digit hydrologic unit code	GIS
Imp_Acres	Impervious Acres	Stormwater Design Report
Last_Change	Date Field	
Permit_Num	Permit Number	MDE permit number
General Comments	Any important comments	GIS
PE_REQ	PE required	Stormwater Design Report
PE_ADR	PE addressed	Stormwater Design Report

POIDrainageArea - Geometry Polygon		
Attribute	Description	Source
BMP_Drain_ID	Unique ID	Sequential number based on Fiscal Year
BMPPOI_ID	POI’s unique ID	BMPPOI
BMPDrainageArea	The drainage area to the POI in acres	Field Calculated
Permit_Num	Permit Number	MDE permit number
Gen_Comments	Any important comments	GIS



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Stormwater Management Facilities

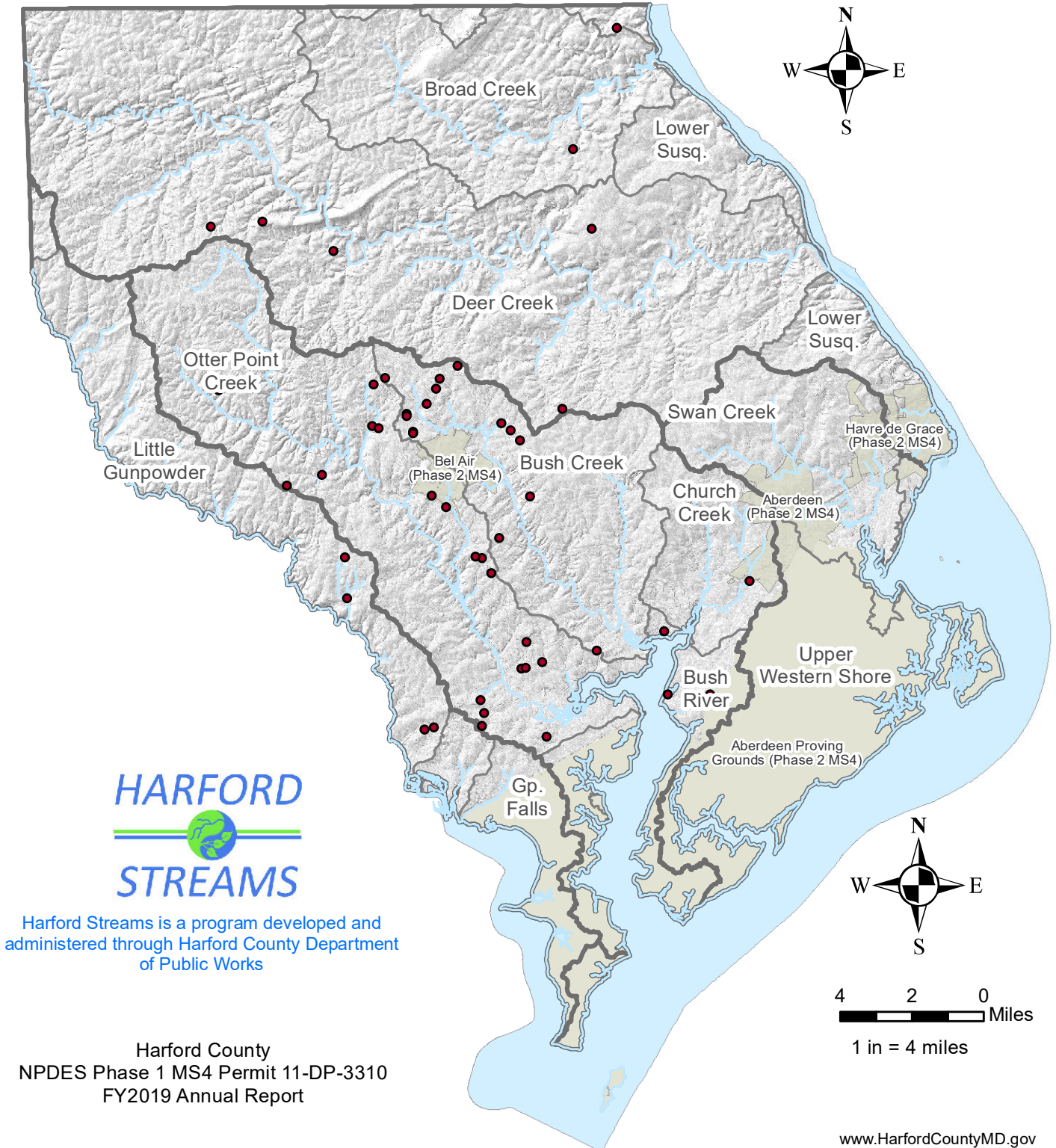
## Appendix C3

### Harford County, MD Department of Public Works Watershed Protection and Restoration

Stormwater As-builts (July 1, 2019 - June 30, 2020)



Barry Glassman  
County Executive



Harford County, MD Department of Public Works

Watershed Protection and Restoration

Stormwater Management Projects Asbuilt during Fiscal Year 2020 (MS4 Permit 11-DP-3310)



Barry Glassman  
County Executive

Project Name	As-built	MDE BMP ID	BMP Type
Addie Estates Lots 3, 13 & 14	08/13/19	HA20BMP010682	Dry Wells
		HA20BMP010683	Grass Swale
Ainsley Forest	08/12/19	HA20BMP010684	Dry Pond
		HA20BMP010685	Grass Swale
		HA20BMP010686	Grass Swale
		HA20BMP010687	Grass Swale
Andys Meadow Lot 3 Only	02/20/20	HA20BMP010688	Dry Wells
Andys Meadow Lot 4 Only	06/02/20	HA20BMP010689	Dry Wells
Andys Meadow Lot 9 Only	01/09/20	HA20BMP010690	Dry Wells
Atlantic Tractor 720 Wheeler School Road	09/26/19	HA20BMP010691	Micro-Bioretenction
		HA20BMP010692	Micro-Bioretenction
Baltimore Pike 703	08/20/19	HA20BMP010693	Micro-Bioretenction
		HA20BMP010694	Micro-Bioretenction
Blakes Legacy Phase 1 Pond 1 - Final As-Built	12/30/19	HA20BMP010695	Wet Pond
		HA20BMP010696	Forebay
Blakes Legacy Phase 2 Ponds 2 & 3 - Final As-Built	08/22/19	HA20BMP010697	Wet Pond



		HA20BMP010698	Forebay
		HA20BMP010699	Wet Pond
		HA20BMP010700	Forebay
Box Hill South Commercial Lots 1, 3 & 4	04/24/20	HA20BMP010701	Bio-Swale
		HA20BMP010702	Micro-Bioretenention
		HA20BMP010703	Micro-Bioretenention
		HA20BMP010704	Micro-Bioretenention
		HA20BMP010705	Micro-Bioretenention
		HA20BMP010706	Micro-Bioretenention
Burkes Purchase Jersey Ct	06/02/20	HA20BMP010707	Sand Filter
		HA20BMP010708	Forebay
		HA20BMP010709	Sand Filter
		HA20BMP010710	Forebay
		HA20BMP010711	Grass Swale
		HA20BMP010712	Grass Swale
		HA20BMP010713	Dry Pond
Cardinals Choice Lot 2 Only	11/19/19	HA20BMP010714	Bio-Swale
		HA20BMP010715	Dry Wells
		HA20BMP010716	Non-Rooftop Disconnect
Cardinals Choice Lot 3 Only	12/30/19	HA20BMP010717	Bio-Swale
		HA20BMP010718	Dry Wells
		HA20BMP010719	Non-Rooftop Disconnect
Cardinals Choice Lot 4 Only	12/10/19	HA20BMP010720	Bio-Swale



		HA20BMP010721	Dry Wells
		HA20BMP010722	Non-Rooftop Disconnect
Cedar Lane Park Bleachers Phase 3A Storage Bldg	04/02/20	HA20BMP010723	Dry Wells
Chick-fil-a 408 Constant Friendship Blvd	09/30/19	HA20BMP010724	Micro-Bioretenction
Claire's Meadow Lot 6 Only	04/24/20	HA20BMP010725	Dry Wells
		HA20BMP010726	Grass Swale
		HA20BMP010727	Non-Rooftop Disconnect
		HA20BMP010728	Rooftop Disconnect
Claire's Meadow Lot 8 Only	11/19/19	HA20BMP010729	Dry Wells
Clayton Station Business Center Lot 15 Car Wash Facility	08/07/19	HA20BMP010730	Micro-Bioretenction
		HA20BMP010731	Micro-Bioretenction
		HA20BMP010732	Micro-Bioretenction
Clorox Phase 2 Trailer Parking Lot Expansion	11/12/19	HA20BMP010733	Micro-Bioretenction
Colvard Choice Pond 1 Final As-Built	08/19/19	HA20BMP010734	Shallow Wetland
		HA20BMP010735	Forebay
Dawson Lands Of Lot 2 5003 Carew Rd	07/25/19	HA20BMP010736	Dry well
		HA20BMP010737	Non-Rooftop Disconnect
		HA20BMP010738	Rooftop Disconnect
		HA20BMP010739	Gravel Filter Strip
Durham Road Lot 3	04/20/20	HA20BMP010740	Landscape Infiltration
		HA20BMP010741	Dry Wells
Durham Road Lot 4	08/14/19	HA20BMP010742	Landscape Infiltration
		HA20BMP010743	Dry Wells

Eastgate Phase 2 Building B - Final As-Built	12/12/19	HA20BMP010744	Grass Swale
		HA20BMP010745	Grass Swale
		HA20BMP010746	Micro-Bioretentention
		HA20BMP010747	Micro-Bioretentention
		HA20BMP010748	Micro-Bioretentoin
		HA20BMP010749	Micro-Bioretentoin
		HA20BMP010750	Wet Pond
		HA20BMP010751	Wet Pond
		HA20BMP010752	Sand Filter
		HA20BMP010753	Sand Filter
		HA20BMP010754	Sand Filter
Eastgate Phase 2 Building C	12/26/19	HA20BMP010755	Grass Swale
		HA20BMP010756	Micro-Bioretentention
		HA20BMP010757	Micro-Bioretentention
		HA20BMP010758	Micro-Bioretentention
		HA20BMP010759	Submerge Gravel Wetland
		HA20BMP010760	Submerge Gravel Wetland
		HA20BMP010761	Wet Pond
Emily Bayless Graham Park - 5 Wheel Rd	02/06/20	HA20BMP010762	Grass Swale
		HA20BMP010763	Micro-Bioretentention
		HA20BMP010764	Micro-Bioretentention
		HA20BMP010765	Rooftop Disconnect
Eva Mar SHA Bioswales	10/29/19	HA20BMP010766	3-Bio-Swlaes

Evergreen Woods Apartments	04/24/20	HA20BMP010767	Micro-Bioretentention
		HA20BMP010768	Micro-Bioretentention
		HA20BMP010769	Micro-Bioretentention
		HA20BMP010770	Micro-Bioretentention
		HA20BMP010771	Micro-Bioretentention
		HA20BMP010772	Detention Pond
		HA20BMP010773	Submerged Grave Wetland
		HA20BMP010774	Grass Swale
		HA20BMP010775	Bio-Swale
		HA20BMP010776	Bio-Swale
Express Care 2006 Rock Spring Road	01/24/20	HA20BMP010777	Micro-Bioretentention
		HA20BMP010778	Underground Storage
Fallston Commons Facility 2 Only	07/22/19	HA20BMP010779	Shallow Wetland
		HA20BMP010780	Forebay
Ferguson Waterworks	03/17/20	HA20BMP010781	Micro-Bioretentention
		HA20BMP010782	Micro-Bioretentention
Forest Hill Business Center Lot 4	06/19/20	HA20BMP010783	Micro-Bioretentention
		HA20BMP010784	Micro-Bioretentention
Forest Hill Heights Addition To Assisted Living Facility	12/30/19	HA20BMP010785	Micro-Bioretentention
		HA20BMP010786	Micro-Bioretentention
Forest Hill Heights Memory Care Addition	12/30/19	HA20BMP010787	Micro-Bioretentention
		HA20BMP010788	Micro-Bioretentention
		HA20BMP010789	Forebay

Gablers Shore Lot 26	06/19/20	HA20BMP010790	Dry well
		HA20BMP010791	Non-Rooftop Disconnect
Gablers Shore Lot 28	06/19/20	HA20BMP010792	Dry well
		HA20BMP010793	Rooftop Disconnect
Golden Spring Section 2 Lot 9	08/08/19	HA20BMP010794	Dry well
		HA20BMP010795	Grass Swale
		HA20BMP010796	Grass Swale
		HA20BMP010797	Grass Swale
Harford Bank 501 Riviera Dr	09/27/19	HA20BMP010798	Micro-Bioretenction
Harlans Glance Section 3 Lot 11	02/26/20	HA20BMP010799	Dry well
		HA20BMP010800	Non-Rooftop Disconnect
		HA20BMP010801	Rooftop Disconnect
Harris Lands Of Lot 2 Only 1337 Rock Ridge Road	07/25/19	HA20BMP010802	Dry Well
HCC - Fallston Hall Renovation	01/14/20	HA20BMP010803	Dry Wells
Hopkins Farm Brewery 3853 Level Rd	06/05/20	HA20BMP010804	Dry Wells
		HA20BMP010805	Non-Rooftop Disconnect
		HA20BMP010806	Micro-Bioretenction
		HA20BMP010807	Micro-Bioretenction
Katen Property Cosner Road	11/07/19	HA20BMP010808	Grass Swale
		HA20BMP010809	Micro-Bioretenction
		HA20BMP010810	Non-Rooftop Disconnect
Lange Estate Lot 6	06/19/20	HA20BMP010811	Grass Swale
		HA20BMP010812	Grass Swale

		HA20BMP010813	Dry Wells
		HA20BMP010814	Rooftop Disconnect
Lorien Of Bel Air Expansion	10/04/19	HA20BMP010815	Micro-Bioreentions
		HA20BMP010816	Micro-Bioretenion
		HA20BMP010817	Micro-Bioretenion
		HA20BMP010818	Micro-Bioretenion
		HA20BMP010819	Micro-Bioretenion
		HA20BMP010820	Micro-Bioretenion
Maryland Golf & Country Club Residential Lot 2	09/25/19	HA20BMP010821	Dry Wells
Nussle Lot 5 1503 Hollingsworth Rd	05/14/20	HA20BMP010822	Dry Wells
		HA20BMP010823	Non-Rooftop Disconnect
Nussle Lot 6 1505 Hollingsworth Rd	05/14/20	HA20BMP010824	Dry Wells
		HA20BMP010825	Grass Swale
		HA20BMP010826	Non-Rooftop Disconnect
Patterson Mill High School Synthetic Turf Field	11/12/19	HA20BMP010827	Recharge Trench
Perryman Roundabout	10/03/19	HA20BMP010828	Micro-Bioretenion
		HA20BMP010829	Bio-Swale
		HA20BMP010830	Bio-Swale
		HA20BMP010831	Bio-Swale
Riverside Auto Auction Phase 2	01/21/20	HA20BMP010833	Dry Pond
		HA20BMP010834	Bio-Swale
		HA20BMP010835	Bio-Swale
		HA20BMP010836	Micro-Bioretenion

		HA20BMP010837	Micro-Bioretenention
		HA20BMP010838	Premeable Pavement
Riverside Business Park Lot 13 - Building Addition	08/14/19	HA20BMP010839	Micro-Bioretenention
		HA20BMP010840	Micro-Bioretenention
Riverside Business Park Lot 30 - Chesapeake Spice Bldg Add	02/06/20	HA20BMP010841	Micro-Bioretenention
Rock Spring Station	01/13/20	HA20BMP010842	Micro-Bioretenention
		HA20BMP010843	Micro-Bioretenention
		HA20BMP010844	Rain Garden
		HA20BMP010845	Dry Pond
Royal Farms Store - #70 500 Joppa Farm Rd	09/27/19	HA20BMP010846	Permeable Pavement
		HA20BMP010847	Micro-Bioretenention
Royal Farms Store #77 - Rt 24 & Rt 7 Reconstruction	10/23/19	HA20BMP010848	Micro-Bioretenention
Ryans Ridge Lots 1-4 Drywells	09/17/19	HA20BMP010849	Dry Wells
		HA20BMP010850	Dry Wells
		HA20BMP010851	Dry Wells
		HA20BMP010852	Dry Wells
		HA20BMP010853	Grass Swale
		HA20BMP010854	Infiltration Trench
Scarff Farm Lot 12	02/27/20	HA20BMP010855	Dry Wells
Trimble Meadows Phase 1 Pond 1	01/08/20	HA20BMP010856	Shallow Wetland
		HA20BMP010857	Foebay
		HA20BMP010858	Forebay
		HA20BMP010859	Forebay

Trimble Road Business Park Lot 5 Fulfillment Drive	01/13/20	HA20BMP010860	Submerged Gravel Wetlands
		HA20BMP010861	Forebay
		HA20BMP010862	Submerged Gravel Wetlands
		HA20BMP010863	Forebay
Unfried, Janet Lot 2	04/24/20	HA20BMP010864	Dry Well
		HA20BMP010865	Non-Rooftop Disconnect
		HA20BMP010866	Grass Swale
Upper Chesapeake Medical Center Lot M	08/20/19	HA20BMP010867	Rain Gardens
		HA20BMP010868	Rain Gardens
Warfield, David Lot 3 Only Rock Spring Rd	09/10/19	HA20BMP010869	Dry Wells
		HA20BMP010870	Rooftop Disconnect
		HA20BMP010871	Non-Rooftop Disconnect
Whiteford Land Association LLC Lot 8	10/22/19	HA20BMP010872	Micro-Bioretenction
		HA20BMP010873	Rooftop Disconnect
Whiteford Land Association LLC Lot 9	12/30/19	HA20BMP010874	Micro-Bioretenction
		HA20BMP010875	Rooftop Disconnect
Whiteford Road 2128 aka Slate Ridge Brewery	10/29/19	HA20BMP010876	Landscape Infiltration
		HA20BMP010877	Landscape Infiltration
		HA20BMP010878	Dry Wells
Woodsdale Road Commercial Repair & A/B	06/05/20	HA20BMP010879	Pocket Wetland
		HA20BMP010880	Pocket Wetland
		HA20BMP010881	Wet Pond
		HA20BMP010882	Forebay

Youth Benefit Elementary School Replacement	06/02/20	HA20BMP010883	Grass Swale
		HA20BMP010884	Non-Rooftop Disconnect
		HA20BMP010885	Micro-Bioretenction
		HA20BMP010886	Micro-Bioretenction
		HA20BMP010887	Micro-Bioretenction
		HA20BMP010888	Micro-Bioretenction
		HA20BMP010889	Micro-Bioretenction

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## Stormwater Management Waiver, Exemptions, Fees in Lieu

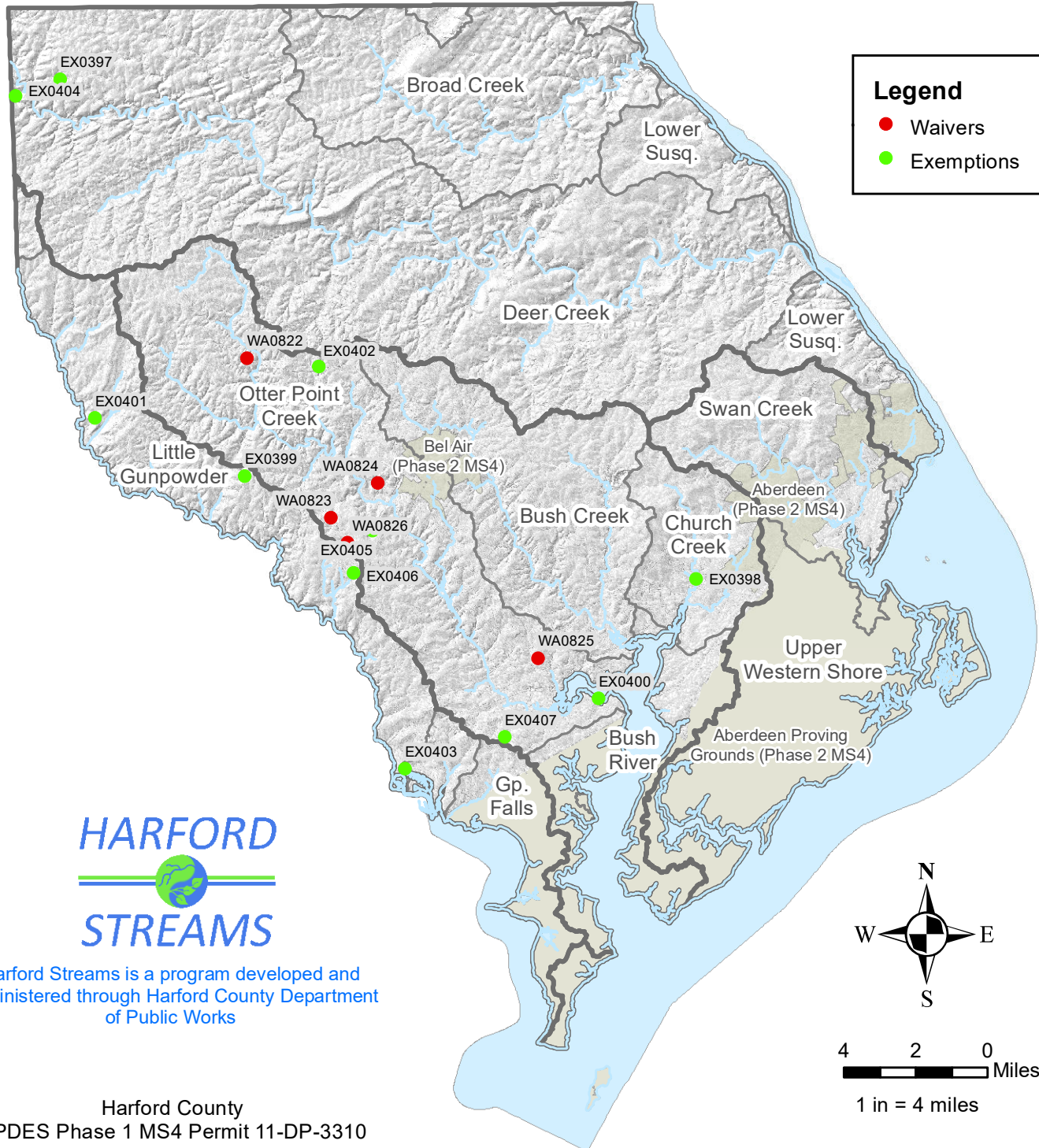
## Appendix C3

### Harford County, MD Department of Public Works Watershed Protection and Restoration

Stormwater Approvals (July 1, 2019 - June 30, 2020)



Barry Glassman  
County Executive



## Appendix C3

### Harford County Stormwater Management Waivers between 7/1/2019 and 6/30/2020

site	location	submit date	approval date	watershed	easting	northing	quantity	quality	ID
2000 CONNOLLY ROAD	2000 CONNOLLY ROAD	4/22/2020	5/7/2020	021307031132	1483363	669861	W4	W4	WA0826
ABINGDON BUSINESS PARK GEOTECHNICAL INVESTIGATION	EAST SIDE OF I-95, BETWEEN ABINGDON ROAD AND VAN BIBBER	3/13/2020	3/31/2020	021307011127	1511353	652868	W4	W4	WA0825
COLONIAL PIPELINE ROUTE 23 ANODE INSTALLATION	NORTH OF EAST-WEST HIGHWAY, SOUTH OF POTEET ROAD	5/14/2019	7/1/2019	021307031134	1468586	696962	W4	W4	WA0822
FALLSTON GLEN LOTS 2 AND 3	2087 AND 2193 STEWART DRIVE	7/12/2019	7/17/2019	021307031132	1480895	673543	W4	W4	WA0823
HEAVENLY POND STREAM RESTORATION	1000 NORTH TOLLGATE ROAD	9/19/2019	9/25/2019	021307031132	1487781	678586	W4	W4	WA0824

#### 1 Waiver Types

- W1 Less than 10% increase (1984 regulations)
- W2 Completely surrounded by existing stormdrain (1984 regulations)
- W3 Provisions to control direct outfall to tidal water
- W4 No increase in imperivous cover (2000 regulations)
- W5 Underground Utilities (2000 regulations)

\* 1984 regulations valid 9/1984 - 1/2002

\* 2000 regulations valid 2/2002 - present

## Appendix C3

### Harford County Stormwater Management Exemptions between 7/1/2019 and 6/30/2020

site	location	submit date	approval date	watershed	easting	northing	type	ID
1320 BALTIMORE PIKE	1320 BALTIMORE PIKE	11/11/2019	4/2/2020	021307031132	1487104	671588	E3	EX0405
2315 BELAIR ROAD - FALLSTON VILLAGE CENTER - TIKI BAR	2315 BELAIR ROAD	6/4/2020	6/10/2020	021308040298	1484321	665423	E3	EX0406
3209 JARRETTSVILLE PIKE DEMOLITIONS	3209 JARRETTSVILLE PIKE	1/9/2020	1/27/2020	021308040299	1446197	688146	E3	EX0401
ACCAPELLA ITALIAN RESTAURANT	2402 PLEASANTVILLE ROAD	9/13/2019	9/20/2019	021308040298	1468268	679632	E3	EX0399
ASBURY PLACE WALTMAN MONOPOLE	1712 HANSON ROAD	4/17/2020	6/25/2020	021307021130	1506502	641240	E3	EX0407
BGE - CONASTONE TO COUNTY LINE WIRE REPLACEMENT	NORTH OF WEST ROAD	2/28/2020	4/2/2020	021202020332	1434584	735598	E3	EX0404
BGE GRACETON-BAGLEY-RAPHAEL WIRE REPLACEMENT	GRACETON SUBSTATION TO RAPHAEL ROAD SUBSTATION	2/3/2020	2/20/2020	021307031132	1479162	695751	E3	EX0402
FREYS ROAD SEWER PETITION	500 BLOCK FREYS ROAD	9/30/2019	10/14/2019	021307011127	1520321	646895	E3	EX0400
SOMBROCK KEY BREWERY	3011 GREEN ROAD	7/12/2019	7/23/2019	021202020332	1441164	738009	E3	EX0397
STEPNEY ROAD SEWER EXTENSION 20062	REAR OF 1503 AND 1505 OLD PHILADELPHIA ROAD	9/13/2019	9/18/2019	021307011129	1534665	664497	E3	EX0398

#### 1 Exemption Types

- E1 Agricultural Land Management
- E2 Additions or Modifications to single family residences
- E3 Developments that disturb less than 5,000 SQ FT
- E4 Land development regulated under State laws
- E5 Single residences on lots greater than 2 acres (1984 regulations)

\* 1984 regulations valid 9/1984 - 1/2002

site	location	submit date	approval date	watershed	easting	northing	type	ID
TOWNE CENTER DRIVE SEWAGE PUMPING STATION IMPROVEMENTS	TOWNE CENTER DRIVE	3/11/2020	4/2/2020	021308040298	1491794	636546	E3	EX0403

**1 Exemption Types**

- E1 Agricultural Land Management
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- E5 Single residences on lots greater than 2 acres (1984 regulations)

*\* 1984 regulations valid 9/1984 - 1/2002*